

In independent claim 65, the present invention is position based; while in independent claims 80 and 81 the present invention concerns orientation control of a display; with all independent claims using one or more datums associated with a person. All the independent claims require stereo pairs of images obtained from cameras (with the cameras provided on the display in claim 65), which stereo images allow one to photogrammetrically (in claims 65 and 81) solve for the three dimensional position or orientation of the datums on the person

In the Action, the examiner has started out rejecting the independent claims 65 (as well as dependent claims 73-74), 80 and 81 by stating as facts two things about the Oh patent that are not correct as follows.

1. The examiner states that the cameras 31 and 31' of the Oh patent are provided on the display. There is nothing of the kind shown or described in the Oh patent, either in figure 1 or the specification (including the cited portion starting at column 4, line 43). As noted in the cited portion, the cameras are described as being in the upper corners of the front wall where it meets the side wall, or at the extremes of the side wall. There is thus a very large included angle between them, which is evidently part of the disclosed design.
2. The examiner also states that the Oh patent acquires a stereo pair of images of one or more datums (again citing the same portion beginning at column 4, line 43). However, there is not one mention of as stereo pair of cameras in this cited portion of the text, nor anywhere else in the OH patent. Indeed, even the word "stereo"

never appears in the Oh patent. It will also be noted that nowhere does there appear in the Oh patent the term "photogrammetry", the science needed to interpret the stereo pair of images produced by the stereo pair of cameras.

These features are all variously as noted above part of the present invention as claimed in the independent claims, but they are not disclosed or made obvious by the Oh patent.

In the Oh patent, the apparatus is seeing the positions of markers using images taken from two TV cameras. But the Oh patent never indicates that these are stereo pairs of camera, and never indicates that stereo photogrammetry is used to determine the positions of the markers. The OH patent text is pretty unclear on the issue of finding the points on the person, though it is not apparent exactly what the Oh patent is doing to get the 3D coordinates. In the applicable description (columns 4-5), the Oh patent says that each camera has a range of view which is adjusted according to the reference sheet 32 on the floor against which the markers are imaged. Then the data is combined to get the 3D positions needed. In some sections of the description, it is stated that a single camera alone can get the posture parameters needed; and then that two sets of posture parameters are combined.

It will also be noted that in the Oh patent, the two cameras are spaced so far apart, with such a large angle between them, that both cameras (30 and 31') are seeing more or less in x and y plane of the reference sheet, while the large angle between the cameras evidently allow the z direction to be determined. Whatever the exact scheme, the two cameras evidently do provide 3D coordinates (evidently only if they are visible to both cameras?), but this scheme is not doing so photogrammetrically using stereo

pairs of cameras as claimed. And by needing a wide angle between the cameras, the cameras cannot both be on the display as claimed in independent claim 65. In any interpretation of figures 1 and 6 of the Oh patent, which are the only ones which show the cameras in relation to each other and the display, the cameras are not on the display. Figure 1 specifically shows camera 31 far distant from the display, and pointed nearly orthogonal to the axis of camera 31'; with the same thing shown again in figure 6, for cameras 31A and 31B as well. There is no teaching of anything like placing the cameras on the display and losing the wide angle between them.

The reason for the use of stereo photogrammetry of the present invention is that it allows an accurate x, y and z measurement, even with cameras spaced relatively more closely with nearly overlapping fields of view. The cameras are thus able to be display mounted, which is a major commercial advantage as most displays are not large in extent.

The arrangement of the present invention has only a relatively small angle - or no angle at all - between the optical axes of the two stereo cameras. This also means that the same portion of the object feature of interest (a marker, in the case of an artificial target) can be seen by each camera, which gives more accuracy to the position determination. The arrangement of the Oh patent with widely spaced obliquely pointed cameras means the processor is getting highly different views of the markers, and likely requires the use very special multisided markers (the Oh patent does not say anything much about them, other than the markers could be LEDs - which are such things, as they emit in all directions). For this reason too, the OH patent cannot in general

accurately obtain data from natural object features, which is additionally claimed in independent claim 81 (and dependent claim 67).

Therefore, for all of the foregoing reasons, it is submitted that independent claims 65, 80 and 81 are neither disclosed nor made obvious by the Oh patent. For these same reasons, it is submitted that dependent claims 66-79 are similarly allowable.

With respect to claims 70, 75-76 and 78 rejected over the Oh patent in view of the Naoi patent, it is submitted that these claims are patentable at least for the same reasons as independent claim 65 from which they depend.

For all of the foregoing reasons, it is submitted that the present application is in condition for allowance and such action is solicited.

Respectfully submitted,

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